Renewable Fuel Standard (RFS2) Briefing for Administrator

12/9/09

Overview

- EISA Renewable Fuel Standard
  - Overview of Key Provisions
- Key Issues
  - RFS2 Lifecycle Results
  - Setting the 2010 Cellulosic
  - Renewable Biomass Provisions
- Schedule

Primary Changes Required by EISA

- **Energy Independence and Security Act (December 2007) required changes to the RFS program**
  - Significantly increased volumes of renewable fuel – to 36 billion gallons
  - Separation of the volume requirements into four separate categories of renewable fuel: cellulosic biofuel, biomass-based diesel, advanced biofuel, total renewable fuel
  - Changes to the definition of renewable fuels to include minimum lifecycle GHG reduction thresholds and grandfathering of volume from certain facilities
  - Restrictions on the types of feedstocks that can be used to make renewable fuel, and the types of land that can be used to grow and harvest feedstocks
  - Inclusion of specific types of waivers and EPA-generated credits for cellulosic biofuel

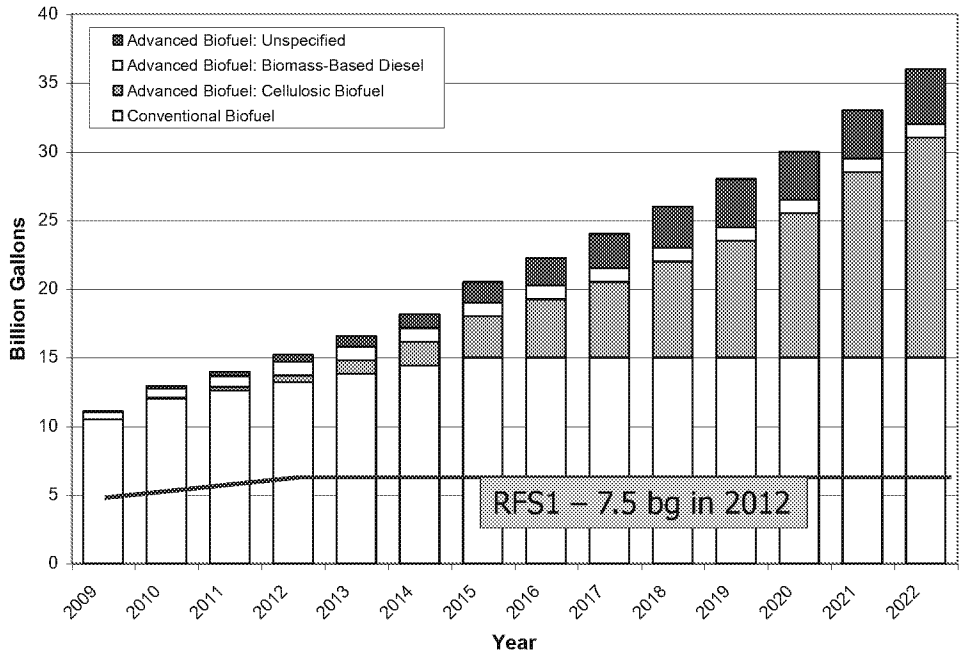
What are the New Standards?

- **Four Separate Standards**
  - **Renewable Biofuel: 15 billion gallons by 2015**
    - Ethanol derived from corn starch – or any other qualifying renewable fuel
    - Must meet 20% lifecycle GHG threshold - Only applies to fuel produced in new facilities
  - **Cellulosic Biofuel: 16 billion gallons by 2022**
    - Renewable fuel produced from cellulose, hemicellulose, or lignin
    - E.g., cellulosic ethanol, BTL diesel, green gasoline, etc.
    - Must meet a 60% lifecycle GHG threshold
  - **Biomass-Based Diesel: 1 billion gallons by 2012 and beyond**
    - E.g., Biodiesel, "renewable diesel" if fats and oils not co-processed with petroleum
    - Must meet a 50% lifecycle GHG threshold
  - **Advanced Biofuel: Minimum of 4 billion additional gallons by 2022**
    - Essentially anything but corn starch ethanol
    - Includes cellulosic biofuels and biomass-based diesel
    - Must meet a 50% lifecycle GHG threshold

  NOTE: Existing biofuel facilities not required to meet GHG threshold for conventional biofuel category – facilities are "Grandfathered"

- **EISA language permits EPA to adjust the lifecycle GHG thresholds by as much as 10% -- (60% to 50%; 50% to 40%; 20% to 10%)**

RFS2 Volumes



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Process Timeline

- **May 5 Rule Proposed Rule Signed**
  - **Published in the Federal Register on May 26**
  - **Public hearing held June 9**
- **Formal Peer Review of lifecycle GHG analyses released for comment in early August**
- **Official comment period closed Sept 25**
  - **Thousands of public comments received – hundreds of substantive comments**

Lifecycle Analysis Since Proposal

- Received and reviewed a significant amount of data, studies, and information from commenters and peer reviewers
- Incorporated a number of new, updated and peer reviewed data sources since the proposal in our analysis
- Performed dozens of new modeling runs, uncertainty analyses, and sensitivity analyses which are leading to greater confidence in our results
- Updated the analyses in conjunction with and based on advice from experts from government, academia, industry, and not for profit institutions including leading experts from Iowa State, Texas A&M, USDA and DOE
- Incorporated many updates since the proposal that had differing impacts on the final results, specifically indirect land use change values are lower than our proposal analysis, resulting in generally higher final lifecycle GHG benefits for biofuels compared to 2005 baseline petroleum fuels replaced

Key Updates which Drive Changes in Lifecycle Results Between Proposal and Final

For corn ethanol:

- Less overall indirect land use change (less land needed)
  - Based on new studies that show the rate of improvement in crop yields as a function of price, crop yields now increase in response to higher prices
    - This results in less land use needed domestically and globally for crops as biofuels expand
  - New research (from Argonne National Lab, Nebraska, and others) available since the proposal indicates corn ethanol co-products are now more efficient at providing animal feed (so need less corn for animal feed)
    - Therefore, we do not impact domestic corn exports as much
- The type of land converted has lower GHG impacts
  - Based on previous satellite data, the proposal assumed cropland expansion onto grassland would require an amount of pasture to be replaced with forest.
  - Disaggregated satellite data indicates that pasture will expand onto existing grasslands

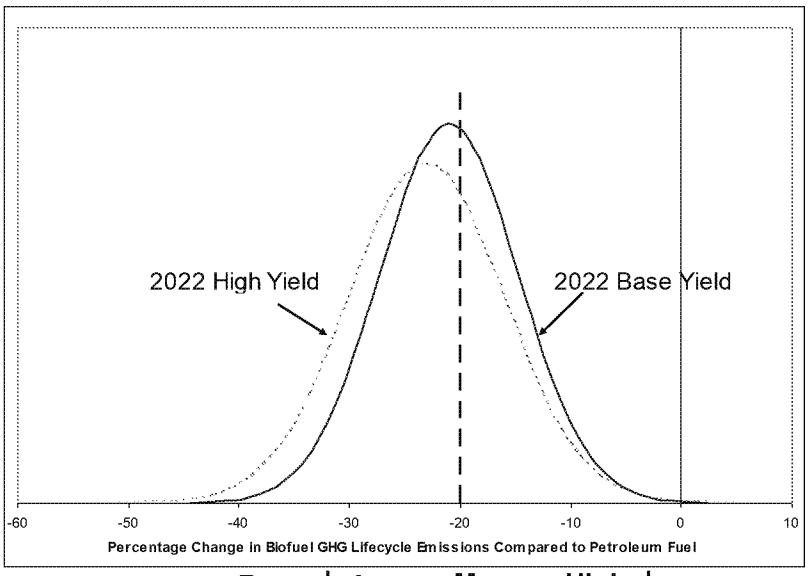
For soybean biodiesel:

- The new information described above also will lead to less overall indirect land use change (less land needed) from soybean biodiesel and the converted land has lower GHG impacts.
- In addition, latest IPCC guidance indicates reduced domestic soybean N_2O emissions.
- Updated USDA and industry data indicated reduction in energy use at the plants and a higher co-product credit.

For sugarcane ethanol:

- There is less overall indirect land use change (less land needed)
  - For the proposal, based on less aggregated satellite data, sugarcane expansion in Brazil resulted in cropland expansion into grassland and pasture replacing forest (similar to corn ethanol and soybean impacts)
  - Based on regional specific data from Brazil, historic trends, and disaggregated satellite data, in the final, sugarcane expands onto grassland and there is greater pasture intensification such that there is very little impact on forests
  - New data provided by commenters reduced sugarcane and ethanol process energy

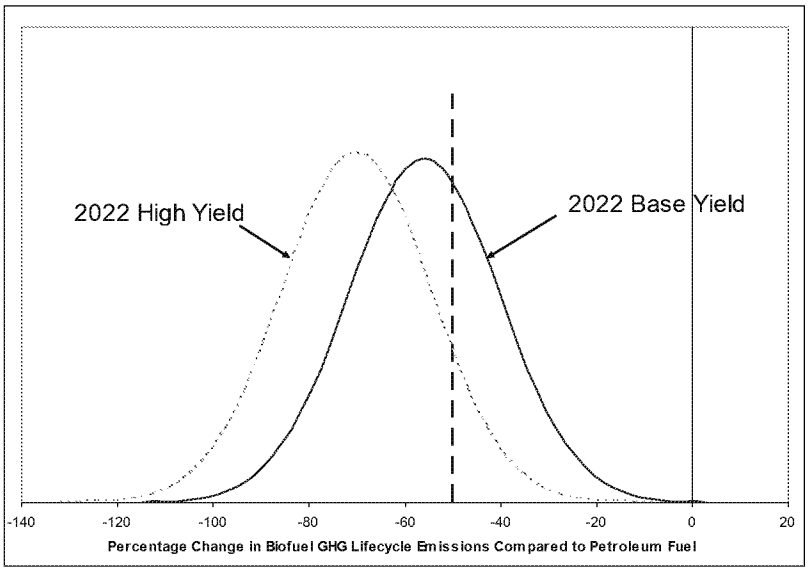
Corn Ethanol Results (2022 - 30 yr 0%)



Range	Low	Mean	High
Base Yield	-32%	-21%	-7%
High Yield	-36%	-23%	-8%

- Average 2022 plant: natural gas, 63% dry, 37% wet DGS (w/ fractionation)
- Lifecycle threshold only applies to new corn ethanol plants (others grandfathered)

Soybean Biodiesel Results (2022 - 30 yr 0%)



Range	Low	Mean	High
Base Yield	-85%	-56%	-22%
High Yield	-98%	-70%	-36%

2010 Cellulosic Biofuel Standard

- EISA includes annual cellulosic biofuel targets, starting with 100 Mgal in 2010
  - But each November, EPA sets the actual standard for the following year
  - Based on EIA's annual production assessment and other market assessments
- The standard for 2010 is contained in the RFS2 FRM
- In our NPRM we proposed upholding the 100 Mgal EISA standard for 2010
  - Projects that served as the basis have since been delayed, cancelled, or scaled back for 2010
  - Projections over the next several years show continued growth
- EIA's October 2009 projections for 2010 estimated that 5.04 million gallons could be produced
  - EPA's internal assessment generally agrees
- We are finalizing the 2010 cellulosic standard using EIA's projection of 5.04 million gallons (6.5 ethanol equivalent gallons)

Renewable Biomass Provisions

- **EISA restricted where feedstocks can grow and be harvested for use in producing renewable fuels for compliance with the RFS2 program**
  - Planted crops/crop residue from ag land cleared/cultivated prior to Dec. 2007
  - Planted trees/tree residue from nonfederal lands and tree plantations cleared/cultivated prior to Dec. 2007

- **Compliance Approach for the Non Agricultural land / Forest land**
  - **Renewable fuel producers can either**
    1: Individually verify / qualify feedstocks following specific recordkeeping and reporting requirements OR

    2: Opt to form a consortium that employs a third party to conduct a verification program that acts to collectively verify / qualify feedstocks for RFS2 renewable fuel production

- **Approach for planted crops / agricultural land**
  - Finalizing an aggregate compliance approach
  - Set a 2007 baseline amount of eligible / qualifying land (402 million acres) which are eligible for feedstock production
  - Annual monitoring agricultural land utilization annually (Using USDA data systems)
  - If land utilization exceeds baseline, require producers to verification using same options being established for the non ag/forest lands

Current Rulemaking Schedule

- December 18: Preamble and Regs to OMB
- December 30: RIA to OMB
- January 15: OMB clearance
- January 19: Administrator Signature
- RFS2 Rule Applies Full Year Volumes in 2010